Claims

1. Method for controlling uplink access transmissions in a radio communication system, wherein
a user equipment (UE1,UE2,UE3,UE4) determines a delay time for transmitting a signal on an uplink access channel (RACH), wherein the delay time is randomly determined based upon a probability distribution that increases in density with increasing delay.

2. Method according to claim 1, wherein
the delay time is determined upon receipt of a request from a base station (NB).

3. Method according to claim 1 or 2, wherein
the base station (NB) transmits the request on a paging channel (PCH) or on a control channel.

4. Method according to one of the previous claims, wherein
the user equipment (UE1,UE2,UE3,UE4) transmits as signal a response signal on a contention based common uplink access channel.

5. Method according to one of the previous claims, wherein
the probability distribution is determined according to:

$$p(t) = x \bullet e^{xt}/(e^{xT} - 1) \quad for \quad t \in [0,T]$$

wherein p(t) denotes a probability that a delay time t is selected, T denotes a predetermined maximum delay time, and x is a parameter that controls the rate of change of probability with time.

6. Method according to one of the claims 1 to 4, wherein the probability distribution is determined according to:

$$p(j) = q^{n-j} \bullet (1-q)/(1-q^n) \quad for\, j \in [0,n]$$

wherein n is the number of sub-intervals in a predetermined time interval T, p(j) denotes a probability that sub-interval j is selected, and q is a parameter that controls the rate of change of probability with sub-interval.

7. Method according to one of the claims 1 to 4, wherein the probability distribution is determined according to:

$$P(j) = (q^{n-j} - q^n)/(1-q^n) \quad for\, j \in [1,n]$$

wherein n is the number of sub-intervals in a predetermined time interval T, p(j) denotes a probability that sub-interval j is selected, and q is a parameter that controls the rate of change of probability with sub-interval.

8. Method according to claim 5, 6 or 7, wherein the parameters are signalled to the user equipment (UE1,UE2,UE3,UE4).

9. Method according to claim 8, wherein the parameters are transmitted together with the request.

10. Method according to one of the previous claims, wherein the network determines if the number of user equipments (UE1,UE2,UE3,UE4) responding to the request exceeds a predetermined threshold for terminating the response procedure, whereby the network signals to the user equipments

(UE1,UE2,UE3,UE4) to terminate further uplink access transmissions if the threshold is exceeded.

11. Method according to claim 10, wherein
the network transmits a dedicated termination signal to the user equipments (UE1,UE2,UE3,UE4), or signals an allocation of resources, thereby implicitly indicating the termination.

12. Method according to claim 10 or 11, wherein
dependent on the determined number of responses received from the user equipments (UE1,UE2,UE3,UE4), the network respectively assigns common resources for at least a number of the user equipments (UE1,UE2,UE3,UE4) or individual resources for each user equipment (UE1,UE2,UE3).

13. Method for controlling uplink access transmissions in a radio communication system, wherein
from a base station (NB) of the radio communication system, time variable information (P(j)) is signalled in downlink (DL) to user equipments (UE1,UE2,UE3,UE4) located in an area covered by the base station (NB), wherein the information is used to determine delay times for transmitting signals on an uplink (UL) access channel (RACH) and wherein the information varies based upon a probability distribution which increases in density with increasing time.

14. Method according to claim 13, wherein
the user equipments (UE1,UE2,UE3,UE4) each compare a randomly determined number (r) with the received information ((P(j)) and, based on the result of the comparison, control the transmission of said uplink signals.

15. Base station (NB) of a radio communication system, with means for signalling a time variable information in downlink (DL) to user equipments located in an area covered by the base station (NB), wherein the information is used in the user equipments to determine delay times for transmitting signals on an uplink (UL) access channel (RACH) and wherein the information varies based upon a probability distribution which increases in density with increasing time, and with means for receiving the uplink signals from the user equipments.

16. User equipment (UE) of a radio communication system, with means for determining a delay time for transmitting a signal on an uplink access channel (RACH), wherein the delay time is randomly determined based upon a probability distribution that increases in density with increasing delay.